The Status of Water Quality in Arizona – 2004

Arizona's Integrated 305(b) Assessment and 303(d) Listing Report

Reissued July 2005 to include EPA revisions

EQR0501

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A special thanks to the monitoring staff who travel across the state collecting the data used in this report, and who provided photographs for this report:

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Cover photo: A view of the Gila River above the confluence of the San Francisco River. This ADEQ sample site is located in the Gila Box Riparian National Conservation Area, south of Morenci, Arizona, in the Upper Gila watershed.

Program Contacts

ADEQ's Web Site – Current information about programs and status of many projects can be downloaded from ADEQ's Web Site: http://www.azdeq.gov.

ADEQ's Programs -- Further information about water quality ambient monitoring data, standards, and assessments can be obtained by contacting the following ADEQ program staff:

Assessments: Melanie Diroll (602) 771-4616
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A more comprehensive list of water quality protection programs is provided in the final appendix of this report (**Appendix E**).

Other Agencies -- Contact the following agencies to obtain further information about their programs or to obtain copies of their data:

Arizona Department of Water Resources - Basic Data (602) 417-2457
Arizona Game and Fish Department (602) 789-3260
    Urban Lakes Program (602) 789-3268
Arizona State Parks
    Slide Rock State Park (520) 639-2962 (Steve Pace)
Environmental Protection Agency Region IX (San Francisco)
    303(d), 305(b) and TMDLs (415) 972-3448 (Peter Kozelka)
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Mohave County Health Department -- Lake Havasu (520) 453-0712 (Sandy Hillery)
National Parks Service
    Glen Canyon National Recreation Area (520) 608-6377
    Grand Canyon National Park (520) 638-7905 (John Rihs)
Salt River Project (602) 236-5900 (Greg Elliott)
Southern Nevada Water Authority (702) 258-3948 (Jeff Johnson)
University of Arizona, (520) 626-2386 (Dave Walker)
US Army Corps of Engineers (213) 452-3529 (Robert Stewart)
US Bureau of Land Management/Phoenix (602) 580-5500 (Jim Renthal)
US Bureau of Reclamation
    Colorado Grand Canyon (520) 556-7051
    Upper Colorado Region (801) 524-3700 (Jerry Miller)
    Lake Powell (928) 608-6377 (Mark Anderson)
US Fish and Wildlife Service (602) 640-2720 (Kirke King)
US Forest Service
    Apache-Sitgreaves National Forest (928) 333-4301
    Coconino National Forest (520) 527-3600
    Coronado National Forest (520) 670-4552 (Robert Lafevre)
    Kaibab National Forest (928) 635-8200 (Dave Brewer)
    Prescott National Forest (928) 567-4121 (Michelle Girard)
    Tonto National Forest (602) 225-5200 (Grant Loomis)
US Geological Survey (480) 379-3087 (Cheryl Partin)
    NAWQA (520) 670-6135 (x223) (Gail Cordy)

Table of Contents

I. Arizona's 2004 Integrated Assessment and Listing Process

Why do we write this report?

This biennial report consolidates reporting requirements under the federal Clean Water Act sections 305(b) (assessments), 303(d) (impaired waters list), 106 (monitoring), 204 (grants), 319 (nonpoint source), and 314 (lakes program). It incorporates recommendations made in the U.S. Environmental Protection Agency's (EPA) "Guidance for 2004 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act" issued in July 2003. This report also provides information required in Arizona's TMDL statute (Arizona Revised Statute 49-231 through 49-238) and Impaired Water Identification Rule (Arizona Administrative Code R11-18-601 through 606).

In addition, the Arizona Department of Environmental Quality (ADEQ) recognizes that this report can provide many state and federal agencies, organizations, and interested parties with a current reference document on the status of surface and ground water quality in Arizona. The following objectives are fulfilled by the publication of this water quality assessment report:

- Report on statewide surface and ground water quality in Arizona (excluding tribal lands).
- Identify and delineate all assessed surface waters.
- Identify the status of designated use support for individual surface waters based on numeric or narrative water quality standards.
- Document the basis for ground water and surface water assessment determinations.
- Identify pollutants or water quality characteristics that cause impairment.
- Identify possible sources of pollutants.
- Indicate where standards are exceeded solely due to natural conditions.
- Describe the state's monitoring program and progress toward achieving comprehensive assessments for all surface waters.
- Identify where additional monitoring may be needed to complete assessments (Planning List) or support the development of Total Maximum Daily Load (TMDL) analyses, including a schedule for this monitoring.
- Identify and prioritize where additional TMDLs need to be completed.
- Provide opportunity for public review and respond to comments concerning assessments and the state's 303(d) listing proposals.

This report was written to be useful for both technical and nontechnical audiences. Technical terms, acronyms, and abbreviations used in his document are defined in **Appendix A.**

State TMDL statute and Impaired Water Identification Rule

The 2002 Integrated Assessment and Listing Report marked a significant change in Arizona's assessment and listing processes, due to new state statutes and regulations adopted in 2000. These statutes and rules regulate the identification of impaired waters and the prioritization and completion of Total Maximum Daily Load (TMDL) analyses. Arizona continues to implement these requirements, described below, in the 2004 report.

A Total Maximum Daily Load Analysis (TMDL)

A TMDL is a written, quantitative plan and analysis to determine the maximum loading on a pollutant basis that a surface water can assimilate and still attain and maintain a specific water quality standard during all conditions. The TMDL allocates the loading capacity of the surface water to point sources and nonpoint sources identified in the watershed, accounting for natural background levels and seasonal variation, with an allocation set aside as a margin of safety.

Total Maximum Daily Load

Statute -- Arizona Revised Statute Title 49, sections 231-238 **(Appendix B)**, established procedures for identifying impaired waters which require TMDL analyses. For 303(d) listing decisions, the statute requires that ADEQ:

- Adopt, by rule, the methods used to identify "impaired" waters.
- Use only reasonably current, credible, and scientifically defensible data.
- Consider the nature of the water (e.g., ephemeral, intermittent, or perennial) in assessing whether a surface water is impaired.
- Determine whether pollutant loadings solely from naturally occurring conditions are sufficient to exceed a water quality standard, and if so, do not list as "impaired".
- Adopt narrative implementation procedures through a public process before using narrative standards to identify impaired waters. These procedures must identify the objective basis for determining a narrative or biological standard violation.

Impaired Water Identification Rule -- ADEQ developed the Impaired Water Identification Rule (R18-11-601through R18-11-606) **(Appendix B)** as required

in the state statute discussed above. These rules establish the following:

- Criteria for identifying a surface water as impaired and placing it and identified pollutants on the 303(d) List
- Criteria for removing a pollutant or surface water from the 303(d) List
- Criteria for prioritizing the 303(d) listed waters for TMDL development
- "Credible data" criteria
- Data submission and record keeping
- General data interpretation requirements
- Criteria for placing a surface water on the Planning List for further monitoring

Although the Impaired Water Identification Rule regulates the listing of waters only, and does not set requirements on those waters not placed on the 303(d) List or Planning List, ADEQ has chosen to apply the same data interpretation criteria to all waters assessed to maintain consistency of methods. Data that do not meet the "credible data requirements" will not be used to make any assessment, be it "attaining" or "impaired." All data collected by or submitted to ADEQ will be considered and noted in the monitoring tables, but will not be used to make an assessment if credible data requirements are not fulfilled.

Federal guidance and regulations

New Federal Guidance – In July 2003, EPA issued "Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act" concerning the development and submission of the 2004 305(b) water quality report and the 303(d) List of impaired waters. This guidance recommended, as it did for the 2002 assessment, that states submit an integrated water quality assessment report that included the state's 303(d) listed waters. **Table 1** indicates the information EPA requested, and where this information can be found in this report.

Table 1. EPA requested data or information

Data or Information Requested	Data or Information Provided in This Report
Geographic delineations of each surface water assessed based on the new National Hydrography Dataset.	Arizona will be sending EPA the geographic delineations requested.
Status of and progress toward achieving comprehensive assessments of all waters.	Chapter VI provides an overview of surface water quality assessments and Chapter VII provides an overview of ground water quality assessments. ADEQ's monitoring programs are described in Chapter VIII.
Water quality standard attainment determinations for each surface water assessed.	Detailed monitoring information for each surface water assessed is provided in Chapter IV. Information is arranged by watershed. These tables clearly indicate the basis for each assessment.
Identify additional monitoring that may be needed to determine water quality standard attainment status and, if necessary, to support development of TMDLs.	The assessment tables in Chapter IV and the five category lists in Chapter V indicate whether a surface water will be on the Planning List or TMDL list and the pollutant(s) of concern. Monitoring activities are being developed based on this information.
Schedules for additional monitoring planned for each surface water assessed.	Chapter VIII describes ADEQ's monitoring programs, how these programs are integrated within the agency and with other agencies, and how waters are scheduled through a 5-year watershed monitoring cycle.
Surface waters and pollutants still requiring TMDLs.	Impaired waters which require TMDLs and their pollutants of concern are identified on the Category 5 list in Chapter V.
TMDL development schedules reflecting the priority ranking of each surface water and/or pollutant combination.	A priority ranking and a schedule for completing TMDLs for each pollutant impairing a surface water is provided in Chapter V.
A description of the assessment and listing methodology used to develop Clean Water Act section 303(d) Lists and section 305(b) Assessments.	Chapter III describes the assessment and listing methods used. Appendix B provides a copy of the Impaired Water Identification Rule and Arizona's statute concerning the listing process and TMDL development.
A description of the public participation process involved in developing the 303(d) list.	The public participation process is described in this chapter (Chapter I).

EPA guidance suggests that each surface water assessed is to be placed on one of the following five categories depending on the sufficiency of data and number of exceedances as defined in Arizona's assessment and listing methods (see discussion in Chapter III):

Category 1. Surface waters are attaining all designated uses.
Category 2. Surface waters are attaining some designated uses but there are insufficient data to assess the remaining uses.
Category 3. Surface waters are inconclusive for all designated uses.
Category 4. Surface waters are assessed as "not attaining" one or more designated use but a Total Maximum Daily Load (TMDL) analysis will not be required for one of the following reasons:
- 4 A. A TMDL has already been completed and approved by EPA but the water quality standards are not yet being attained.
- 4 B. Other pollution control requirements are reasonably expected to result in the attainment of water quality standards by the next regularly scheduled listing cycle.
- 4 C. The impairment is not related to a "pollutant" loading but rather caused by "pollution" (e.g., hydrologic modification).

Category 5. Surface waters are impaired for one or more designated uses by a pollutant and require development of a TMDL.

Note that federal regulations require that waters assessed as "threatened" be placed in Category 5. For this assessment, no waters were assessed as "threatened." Procedures for trend analysis to determine waters that are threatened will need to be developed through a public process before these listings can be made.

Federal Regulations -- Impaired water listing requirements are also established in federal regulations (40 Code of Federal Regulations parts 122, 124, and 130.7). These regulations were applied in this assessment.

Changes in the assessment process

A few significant changes, summarized below, have been made to ADEQ's water quality assessment process since the last report in 2002.

Application of Chronic Standards -- The 2004 assessment is the first one where ADEQ has made 303(d) listings for chronic Aquatic and Wildlife standards using the requirements of the Impaired Water Identification Rule (**Appendix B**, R18-11-605.D.2.b). In accordance with the rule, a surface water is assessed as "impaired" if more than one exceedance of an Aquatic and Wildlife chronic water quality standard occurs. Although a geometric mean of the last four samples must be taken to apply the standard for enforcement purposes, the Impaired Water Identification Rule requires only two exceedances to be placed on the 303(d) List, with no application of a geometric mean.

Acute and Chronic Standards

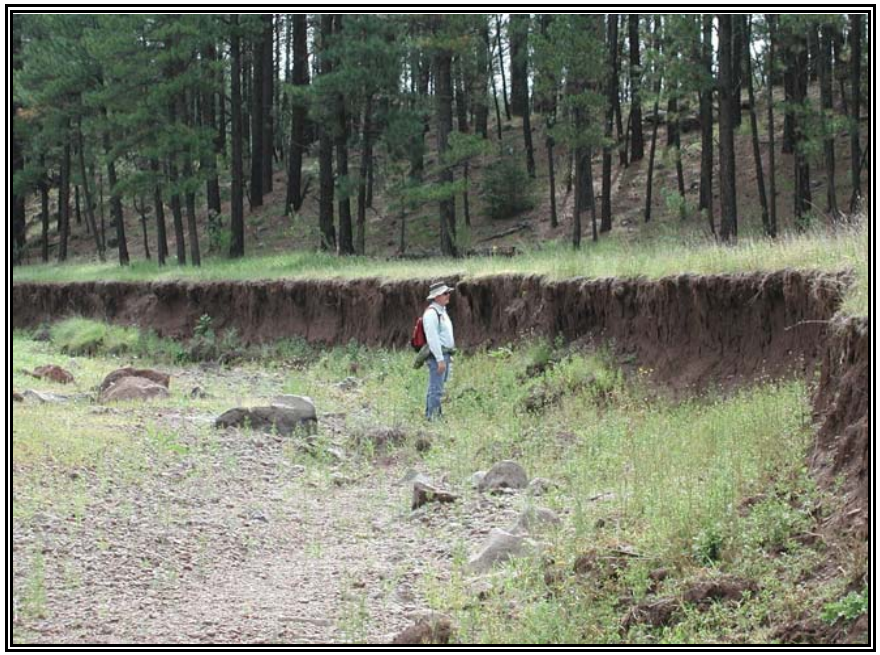
Some water quality parameters have both an "acute" and a "chronic" standard (**Appendix C**). Acute standards are set at higher concentrations than chronic standards to protect aquatic life and wildlife from short-term exposures to the parameter of concern. Chronic standards are set at lower concentrations than acute standards to protect aquatic life and wildlife from effects of long-term exposure.

Turbidity and the New Suspended Sediment Concentration Standard – Arizona repealed its turbidity standard in March of 2002 and adopted a suspended sediment concentration (SSC) standard of 80 mg/L, expressed as a geometric mean with a four sample minimum, to protect Aquatic and Wildlife designated uses. As established in Arizona's Impaired Water Identification Rule (**Appendix B**), more than one exceedance of this geometric mean standard would result in an assessment of "impaired." One exceedance would be assessed as "inconclusive."

The new suspended sediment concentration standard is only applicable to samples collected at or near base flow, which the U.S. Geological Survey (USGS) defines as "flow sustained largely by ground water discharge." Precipitation events and most runoff must be excluded. To apply this standard for assessment purposes, it is necessary to calculate base flow for each site, which requires a large amount of flow data. Therefore, an assessment of SSC was usually possible only at or near USGS gaging stations, where an abundance of current and historical flow data is available. SSC assessment methods are explained in Chapter III.

Since the SSC standard was just recently adopted in 2002, a minimal amount of data were available for this assessment. Thus, ADEQ has continued to assess the turbidity standard repealed in 2002 in an effort to record potential suspended sediment problems. Additionally, these exceedances provide evidence of a potential narrative bottom deposit standard violation. The standard was assessed according to the methods described in Chapter III, and waters were either assessed as "attaining" or "inconclusive" due to turbidity. No 303(d) listings were made based on this parameter, since the standard was repealed. Any waters that would have been impaired or inconclusive under the former standard were called "inconclusive" and placed on the Planning List for further study.

EPA placed three stream reaches on the 303(d) List, citing exceedances of the former turbidity standard as evidence of a narrative standard violation. ADEQ cannot make 303(d) listings based on narrative standards violations until narrative standard implementation procedures are adopted (procedures are currently being developed). A table showing all waters with significant turbidity and/or SSC exceedances appears in Chapter VI.



An ADEQ staff member, standing in a dry streambed, surveys the effects of erosion on Beaver Creek, located near Sprucedale, Arizona. Erosion of stream banks is a major contributor of suspended sediment in surface water.

How is the assessment and listing approved?

The Arizona 2004 303(d) Submission to EPA – In accordance with Arizona Revised Statute (49-232.A), the proposed 303(d) List is submitted to EPA following public review and publication of the list and response to comments in the Arizona Administrative Register. The 303(d) List is due to EPA on April 1st of each even-numbered year. This report is available at ADEQs web site in Adobe PDF format at: www.azdeq.gov.

The table showing Category 5 surface waters is the list of impaired waters that is submitted to EPA. The list identifies, by surface water segment, the pollutants or surface water characteristics not meeting surface water quality standards. EPA must approve this list and has the authority to add or remove surface waters from the list based on the federal Clean Water Act, regulations, or policies. Therefore, the list shown in this report can be modified by EPA. If changes are made, ADEQ will then provide a revised list on its internet site: www.azdeq.gov.

Public Participation in Arizona's Listing Process – Communicating with the public and promoting public input into the 303(d) listing process is an integral component of ADEQ's water quality management programs. A 30-day public review of the draft Integrated Report is provided. A copy of the report is posted on ADEQ's web site, notices are placed in six local newspapers throughout the state (Phoenix, Tucson, Flagstaff, Sierra Vista, Yuma, and St. Johns), and flyers concerning the public review are mailed to a list of interested persons. Copies of the draft report are available on CD, in hard copy, or as an electronic download from the Internet.

Arizona's TMDL statute provides that any party who submits written comments on the draft list may challenge a surface water listing. Any challenged listing is not included on the initial submission to EPA, but may be subsequently submitted if the listing is upheld in the director's final administrative decision.

The response to comments and the draft 303(d) List are published in the Arizona Administrative Register, according to Arizona Revised Statute 49-232. Publication of the list in the Arizona Administrative Register is an appealable agency action and may be appealed by any party that submitted written comments on the draft list. When a notice of appeal of a listing occurs within the 45-day publication period in the Arizona Administrative Register, these listings are not included in ADEQ's its initial submission to EPA until the listing is upheld by ADEQ's Director or if the challenge is withdrawn.

EPA List Approval Process -- Within 30 days of receipt of a completed listing package, EPA must act on a state's list and priority ranking. EPA may approve or disapprove the entire list or disapprove only deficient portions.

If it disapproves a portion, EPA must identify corrections (i.e., surface waters, pollutant(s), priority rankings) needed to make the list consistent with EPA regulations. EPA must also initiate another public review and comment period. The agency publishes its intended revisions in the *Federal Register*, newspaper notices, and other methods of notifying interested parties. At the end of the comment period, EPA evaluates public comments and compiles a revised list. This corrected list is sent back to ADEQ to be incorporated into the water quality management plans and used as Arizona's approved 2004 303(d) List.

In 2004, EPA partially approved and partially disapproved ADEQ's list of impaired waters. The agency added 19 waterbodies to the list, as well as eight additional pollutants to surface waters already on the list. This revised final report includes all of EPA's additions.

EPA Action on the Methods – Arizona's Impaired Water Identification Rule **(Appendix B)** establishes Arizona's 303(d) listing methods. EPA provided comments on the rule in 2002 when it was developed. Although EPA does not have authority to approve this rule, EPA considers the methods it establishes when it reviews the 303(d) List Arizona submits. As described above, EPA may cite any deficiencies it raised in comments as a factor in a decision to disapprove all or part of Arizona's 303(d) List.

After EPA's final action is taken, ADEQ posts the final 2004 303(d) List on its website. Copies of the 2002 303(d) List (the current list, until EPA approves the 2004 list) are downloadable from the ADEQ web site in Adobe PDF format at: www.azdeq.gov.

An ADEQ staff member prepares to sample Willow Creek, north of Hannagan Meadow, on a snowy day in eastern Arizona.